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Cost Accounting as a management tool in the Department of the Navy

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COST ACCOUNTING AS A MANAGEMENT TOOL IN THE DEPARTMENT OF THE NAVY

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PREFACE

The purpose of this paper is to present a brief outline of a management tool which has recently reached general utilization in the Department of the Navy. An effective cost accounting system is the management tool to which reference is made. A cost accounting system is an integral part of an effective management concept, which also embraces operational budgets and a reporting system. Operational budgets, a reporting system, and a cost accounting system integrate together into a control system which provides a basis for effectively planning and controlling the operations of an enterprise. These integral parts of this control system are so interrelated that each contributes to the operation of the others; yet each is most effective only when used in conjunction with the others. A previous paper, Performance Reporting As A Management Tool In the Department of the Navy, treated the reporting aspects of this control system. This paper is intended to treat the cost accounting aspects of this control system. Chapter I is a brief summary of cost accounting principles. Chapter II is a brief summary of application of these principles in the Department of the Navy.

The managements of Navy installations have always been most aware of the costs of accomplishment of objectives. However, cost control systems have only recently appeared on the scene to focus the attention of all levels of management on cost problems at the field installation level.

The scope of this paper is much too short to present a technical discussion of cost accounting, nor is such a presentation considered feasible

in a few pages. The intention is to present general principles of cost control, leaving details to the most qualified authors in the field, some of whom are listed in the bibliography.

I wish to acknowledge the invaluable assistance of two very able gentlemen, who have patiently explained cost accounting principles in the Department of the Navy. These two gentlemen are: Mr. Frank W. Marshall, Office of the Comptroller of the Navy, Department of the Navy; and Mr. Marvin M. Wofsey, Bureau of Supplies and Accounts, Department of the Navy. Theodore Lang's Cost Accountant's Handbook has been used as a basic reference.

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CHAPTER I

THE THEORY OF COST CONTROL

Section 1. Introduction

The activities of the modern business enterprise tend to become complex in nature to the extent that the management team is unable to personally supervise every phase of the operations. In order to reduce the vast amounts of information concerning the operations of the enterprise, various reporting systems are established which provide only that information needed in the making of decisions. These reporting systems convey only the information necessary for members of the management team to effectively supervise the operations for which they are responsible; present operating information in quantities which can be grasped by the human brain; and stimulate decisions needed for effective control of operations. In order that all activities of the enterprise may be evaluated, reporting systems must speak a common language. Units of output in one division of the enterprise may differ markedly from the units of output in other divisions. Therefore, the language adopted by the reporting systems is units of money. If the profitableness of a particular pursuit is to be evaluated in its proper light, the cost of that pursuit must be known to those who formulate operating policies for the enterprise. In summary, it can be stated that the objectives of reporting systems is to furnish the necessary information from both operating and cost angles; to present in the most practical way the facts that reveal actual working conditions and situations; to facilitate effective supervision of operations; to aid in attainment of high standards of efficiency and realization of maximum net profit; and to aid in determining policies.

The use of cost and operating reports in an enterprise make it possible to plan operations systematically in advance; to obtain efficient operations; to reduce spoilage, waste, and loss; to realize final results of planned operations; to improve processes, methods, and procedures; to conserve the resources of the enterprise; to secure low costs; and to secure rapid turnover of working capital.

The above objectives and uses of cost and operating reports demonstrate that application of reporting systems is not limited only to the large, complex enterprise, but also to the small enterprise if it is to be effectively managed.

A reporting system cannot be effective unless it is utilized by executives. Therefore, the output of the reporting system must be adapted to the needs of particular executives in each level of management. Reports submitted to minor executives should be detailed in character and should emphasize cost control. These executives are in close contact with expenditures for labor, material, and overhead; their concern lies primarily with supervision of their departments in such a way that internal operations are both efficient and well coordinated with other departments. Reports for the use of intermediate executives, primarily the heads of specialized staff departments, should emphasize special information useful in planning future policies of the enterprise. The reports for use by general executives are broadest in scope and, as far as practicable, should be carefully summarized or condensed.

The effective evaluation of the activities of an enterprise, based on an effective reporting system, involves cost analysis and cost control. Cost analysis for managerial control purposes may be defined as the comparison of actual with anticipated or predetermined costs (a basic element of a sound

reporting system including the budget concept), to determine what variations have occurred, their extent and causes; to discover conditions underlying each cause, and to develop or revise policies, plans, methods, and practices for the purpose of eliminating unfavorable conditions; and to apply these procedures to situations requiring improvement. The purpose of cost analysis is to obtain control over costs. Cost control is therefore defined as the guidance and regulation of the operations of an enterprise through the measuring of performance. The four essential steps in establishing and maintaining control over costs are:

1. A clear definition of the objective, which involves a predetermination of what the results should be and what it should cost to secure them.

2. A measurement of actual accomplishment in comparison with the plan, which necessitates establishment of a continuous and current comparison of actual costs with standard costs in order to develop variances from standards.

3. Investigation to determine the causes of failure to perform according to plan.

4. Institution of corrective action where needed to bring substandard performance into line with standards.

Standard costs as a tool of management. The actual cost of a unit of product conveys no information, by itself, concerning the efficiency with which it was produced. If, however, the actual cost can be set beside a standard cost which represents a known level of accomplishment, it is a simple matter to compare the two costs and grasp the significance of the actual cost figure. Lord Kelvin has been credited with the remark: "When you can measure what you are speaking of, and express it in numbers, you know something about it. When you cannot, ... your knowledge is of a meager and

unsatisfactory kind."[1]

Introduction of a standard cost system is a step in the process of establishing complete control over all factors which are subject to the influence of management. Pioneers in the scientific management movement found that good physical standards (that is, standards expressed in terms of pounds of material, hours of labor, etc.) were basic to real control over both the amount and the quality of work done in a shop. The general procedure was to determine by study and experiment:

1. What constituted a proper level of performance.

2. The best method or most satisfactory design to be used as a model of excellence to which to conform and as a base from which to measure deviation from the preestablished goal.

Maintenance of a desired production schedule is not in itself sufficient to protect profits or efficiency of operation; instead the production schedule must be achieved at a proper cost in terms of both technical and economic efficiency. Standards which serve as a basis for control of operations must represent not only physical quantities of materials and services, but also costs of these services.

The term "standard costs" is defined on the basis of several aspects concerning which there is general agreement among accountants. The first aspect is that standard costs are predetermined costs. Standard costs are established by a process of scientific fact finding which utilizes both past experience and controlled experiment. The process of setting standard costs includes: (a) A careful selection of materials; (b) time and motion studies of operations; (c) an engineering study of equipment and other manufacturing

[1]W. W. Voorhees, "Setting Standard Costs". Corporate Treasurer's and Controller's Handbook, ed. by L. Doris (New York: Prentice-Hall, Inc., 1950), p. 155.

facilities. Predetermined costs which represent some average of past experience or personal opinion not based upon a scientific assembly of facts are termed "estimated costs". The second aspect is that standard costs represent a carefully planned method of making a product or rendering a service.

Some definition of terms is desirable in order to understand the full implications of a control system based on standard costs. A standard is defined by Webster's New Ideal Dictionary as that which is established by authority as a rule for measuring; ... being, or according with, a standard for comparison; having a recognized value. A cost standard is defined as standard material, labor, or burden cost of any item, factor, or operation, set after careful analysis and established by authority as a rule for measuring and comparison. The standard cost method is defined as an accounting plan which compares actual net profits with predicted net profits based on computation of the standard cost of production, budgets of expense, and budgets of sales volume; with analyses of variations from predicted results, by their causes.

Beyond the above aspects of general agreement among accountants there is a field of controversy. The principal differences lie in, first, whether a standard should be a current standard, which reflects what performance should be in the period for which the standard is to be used, or a basic standard, which is to serve merely as a standard of measurement or point of reference; and, second, whether the standard should be set at an actually expected, a normal, or an ideal level of accomplishment. A current standard is defined as one which is intended to be representative of what cost actually should be under prevailing circumstances. It is regarded as a real cost to be carried through the books of account and into the financial statements. These standards must be revised frequently to reflect changes in methods and

prices. A basic standard is intended to serve only as a yardstick with which both expected and actual performance can be compared. The plan of cost accounting used with this type of standard proceeds by reducing actual costs to percentage relatives with standard cost as a base. Basic standards facilitate showing of trends in current expected and current actual costs relative to the basic standard costs. Hence, basic standards must remain fixed and are changed only when methods of operations are altered.

The operating levels at which standards are set fall into three general classes. First, standards which are based on expected actual costs are set at a level which represents the costs actually expected to be incurred if prices of materials and services are as anticipated and if usage of these elements corresponds to the planned volume of production. Variances represent deviations from expected degree of efficiency from usage of production factors; prices of materials and services; planned volume of production. Second, standards which are based on normal capacity are set at a level regarded as "normal". A normal standard is the average level expected to be attainable over a period of time long enough to cover one or more operating cycles. Variances under this system are deviations from normal efficiency and normal volume. Third, ideal standards are set at the best performance that can be attained under the most favorable circumstances possible.

It is considered appropriate to return to the discussion concerning the place of reporting systems in the management of enterprises. Effective management requires the planning of activities of the enterprise in future periods. The budget concept is a means of enabling management to foresee operational situations which will be present under future conditions and to forecast necessary operational adjustments to meet these conditions. The budget spells out these adjustments. The reporting systems provide a means of

informing management of how well actual current operations are meeting these adjustments. Standard costs measure regular expenses of operation in order to meet the budget objectives of income and expense and provide a yardstick to determine actual performance against budgeted levels of activity.

Standard costs aid in the standardization of products, methods, and processes; focus attention on variations from established standards of production cost and factory expense; provide a means of analysis of variations; provide a common unit of comparison of labor costs; set normal plant capacities; provide a uniform base of comparison for all cost elements; provide a basis for evaluating investments in inventories; provide a basis for determination of idle equipment or idle capacity expense; provide objectives for all divisions; assist executives in more effective control by concentrating on exceptions from standards.

The setting of labor cost standards requires the setting of time and rate standards, which results in the recognition of the standard productive hour as the basic unit of labor cost comparison of dissimilar parts and processes. This common unit of comparison makes possible conversion of sales quotas into production budgets and the computation of reliable plant capacities.

Direct material standards. Certain basic data is necessary before the actual setting of cost standards can be undertaken. The collection of this data requires the services of various technical staffs, such as the design engineers, production engineers, and time and motion study engineers. The setting of material price standards requires fixing a standard unit cost for each kind of material used. Establishment of a standard cost system presupposes the existence of adequate physical control over the processes of procuring, storing, issuing, and handling of materials from the time a request to purchase is initiated until the finished goods are shipped to a customer.

Dependable cost reports require adequate control over material requirements.

Direct labor standards. The first step in setting labor standards is selection of the best operating method available, in order that it may be used as a basis for the standards. This includes standardization of all surrounding conditions that in any way influence the effectiveness with which the worker performs his task. Included in this area of consideration are: Layout, conditions of equipment, workplace; control over materials to insure correct quality and quantity available in the proper place; a system for planning, routing, and dispatching of work; and provision of all needed instructions for the worker. Since standard costs are based upon methods and conditions desirable of attainment, variations of actual from standard become indicative of real variations in efficiency relative to the standards. Sufficient control over the worker's environment must be provided to avoid introduction of uncertainty into the interpretation of standards and variances from standards.

Establishment of standard operation time requires determination of time needed to complete each operation when working under standard conditions. Standard operation times are generally set by time and motion study; average of past performance; or advance estimate.

There is usually considerable variation in rates paid for labor. Therefore, the first step in setting labor rate standards should be establishment of a classification of labor grades used. The aim is to set up a logical basis for differentials in wage rates, and to make possible specification of the particular grade of labor that is to be used for each operation. The next step is setting of a standard rate of pay for each of these grades of labor. Since different wage plans do not result in the same unit cost for labor, it is necessary to consider the wage payment plan in establishing

labor rate standards. Maintenance of control over labor cost requires an adequate and effective system for timekeeping and payroll handling. Without this system, data going into the accounts cannot be sufficiently reliable to be of value either as a guide to management or determination of financial statement figures.

Manufacturing expense standards. Overhead, manufacturing expense, or burden consists of all charges other than those directly identified with the product. The latter include direct material, direct labor, and such other charges as constitute specific costs of product units. There is always a residue of costs that cannot be charged directly to product units and these fall in the overhead category. Overhead is a composite of costs which behave very differently. It is therefore necessary that overhead be broken down into elements that are reasonably homogeneous since many essential facts are obscured when unlike costs are lumped together. The aim of overhead standards is to localize and control expenses for purposes of cost control. The first step in establishing standards for overhead costs is an analysis of expenses by operating divisions of the business. A primary breakdown is the separation of service departments from productive departments. Service department costs are collected in order to distribute them to the overhead accounts of productive departments which use the services. Unit cost rates for services are determined whereever possible in order that direct charges to consuming departments can be made. If conditions within the productive department are not uniform, overhead is classified by production centers. Thus overhead rates are established on a cost center basis.

The next step in the establishment of overhead standards is the separation of fixed and variable costs. Perfectly variable costs increase or decrease in proportion to the volume of work in the plant and hence are

controlled by keeping them within the limits set by current activity. Fixed costs do not change in total amount during a short period of time and hence they cannot be adjusted to current activity. When activity drops, variable costs should be curtailed sufficiently to prevent an increase in unit variable cost, but, since fixed costs cannot be reduced for a temporary decrease in activity, the fixed unit cost rises. It is difficult to place responsibility for increases in costs when costs charged to a given department contain prorated fixed charges unless these fixed charges are clearly separated from the variable costs subject to control by the department charged. It is desirable to subject actual usage of overhead supplies, labor, and services to an engineering study to determine more accurately how much of each of these should be consumed.

The standard overhead expense may be represented as a schedule, a curve, or a formula which reveals the way in which total usage should vary as activity fluctuates.

The practical capacity of a plant is what the plant could produce if there were no lack of orders, and is less than the maximum physical capacity by the amount of unavoidable idleness for repairs, unforeseeable breakdown, shortages of material or labor, and other interruptions not humanly preventable. Average capacity of a plant allows both for unavoidable interruptions and for an average amount of idleness due to lack of orders. Either practical capacity or average capacity are referred to as normal plant capacity for purposes of absorbing overhead expenses. Whichever capacity level is chosen requires that one hundred per cent of the fixed overhead be absorbed by the product. It is this level from which the under- or overabsorbed activity variances are measured.

Fixed costs are associated with providing manufacturing facilities in

readiness for use, regardless of whether or not they are being used at the moment. The amount of equipment and the size of the organization which is to be kept intact is a matter of managerial policy, as is the amount to be spent for maintenance and repairs. Thus fixed costs are fixed only by managerial policy, which is subject to change.

Responsibility for setting standard costs. When costs are classified according to personal authority over spending, responsibility for each item can then be assigned to a specific person, a standard can be established, and that person held accountable for variances arising from any failure to meet the standard. It is necessary to determine both primary and secondary authority, for where foremen have primary authority to use supplies and power, superintendents are expected to see that the foremen under them keep their costs under control. The general direction and supervision of a standardization program is commonly delegated to a committee created for the purpose. Since setting standards is essentially a research problem, members of the committee must have sufficient technical knowledge to carry forward a program of research in the selection and usage of materials. It is advisable to have proposed standards reviewed by those persons who will be held responsible for their maintenance. This review serves as a check upon the work of the standards committee and introduces the standard without the stigma of it being imposed. This procedure establishes cooperation in enforcing standards and avoids shifting responsibility for unfavorable variances by questioning the validity of the standards.

Current standard costs must be changed when prices, manufacturing methods, product specifications, or other circumstances change to such an extent that the standard no longer represents a good measure of performance. It is for this reason that standard costs are reviewed once a year.

Section 2. Operation of Standard Costs

Incorporation of standard costs in the accounts. Incorporation of standard costs in the financial accounts improves the accuracy of the clerical work involved and insures more serious attention from executives for data drawn from the accounts. Considerable variation exists in bookkeeping methods for handling standard costs. All these methods can be classified as one of three principal types according to the manner in which the Work in Process account is handled. First, under the Partial Plan debits are entered in the Work in Process account at actual cost and credits to the Work in Process account are entered at standard cost. Second, under the Single Plan both debits and credits to the Work in Process account are entered at standard cost. Third, under the Dual Plan debits and credits are entered in the Work in Process account at both actual and standard cost.

Variances from standard cost can be expressed in either absolute or relative numbers. In the first instance, the variance is computed by subtracting actual cost from standard cost. If the actual exceeds the standard cost, the variance is a negative figure; if actual is less than standard cost, the variance is a positive figure. In the second instance, the variance is computed by dividing the standard cost figure into the actual cost figure to obtain the actual cost as a percentage of standard cost. The result, which may be either positive or negative depending upon whether actual cost is less or greater than standard cost, is the cost variance expressed as a percentage of standard cost. The two methods are complementary and both are required for an understanding of the cost variation that has taken place.

There is considerable difference of opinion as to the ultimate disposal of cost variances arising under the Partial or Single Plan. The methods used are: (1) Close out to Profit and Loss or to Cost of Sales;

(2) distribute to Inventories and Cost of Sales; (3) close out to Reserve Accounts. Under method (1) the standard cost represents a justifiable cost of manufacture, and inventory valuations are conservative since they do not include the cost of waste, inefficiency, and excessive overhead. Under method (2) both inventories and cost of goods sold are shown at actual cost in the financial statements. Since actual costs are regarded as facts, it is felt that they should be used in the financial statements regardless of their effect. Under method (3) variance gains are considered as reserves to be carried until offset by variance losses. Utilization balances resulting from seasonality in the use of plant should cancel out over a complete seasonal cycle, and any amount remaining at the end of the year should then be written off.

In summary, it can be stated that when the purpose of variances is that of measuring efficiency of performance and maintaining control over operations, it is essential that variances be reported separately from standard costs. When they have served these objects, they may be written off to Profit and Loss or to Cost of Sales, or be set up as Reserves.

Under the Dual Plan of accounting, entries in inventory accounts are made at both standard and actual costs and the two are carried in parallel columns in the ledger accounts. Only actual cost figures are carried into Cost of Sales and to the financial statements. Variances are primarily computed in percentage rather than in absolute terms.

Comparison of standard cost-keeping methods. Any cost accounting method must provide management with cost information needed to operate the enterprise intelligently and efficiently. An additional requirement is that of economy in operation, for costs should not only be obtainable, but obtainable with a minimum expenditure of money and effort. The limit at

which expansion of a cost system should stop is the point where costs exceed the benefits returned for the expenditure. Consideration must be given to preferences and limitations of executives who are to use cost data. Where optional methods are available for securing costs, the accountant must choose the one which gives the optimum balance between utility to management and expense of operation.

Since the Work in Process account is charged and credited at standard under the Single Plan, this method has the principal advantages of promptness with which variances from standard costs are disclosed, simplicity and economy with which accounts are operated, and the ability to provide analysis of variances in as much detail as management may desire. It is based upon the theory that standard costs are real costs suitable for inclusion in the financial statements. It is for these reasons that this plan is probably the most common. However, it is practically impossible to allocate variances to product classes under the Single Plan with any accuracy. This plan gives control information but the cost information is not particularly useful.

Under the Partial Plan the Work in Process account is charged at actual and credited at standard cost. Where the work to be costed comprises only a few simple operations, where clerical work must be kept at a minimum, and where detailed analyses of variances from standard are not desired, this plan is serviceable. When variances are not revealed until the end of the accounting period and after an inventory of work in process has been taken, information for control purposes is too late to avoid losses that have occurred by reason of waste or inefficiency. Consequently, this method has infrequent application.

The Dual Plan provides essentially the same information as the Single Plan, but has the principal feature of the use of percentages rather

than amounts. It relies upon arithmetical processes of division and multiplication rather than upon addition and subtraction, as do the other methods. In comparison with the Single Plan, it is not so effective in providing variance data with promptness since it is necessary to have entries made in the accounts and the ratios computed before actual performance can be compared with standard. In contrast with the Single Plan, the Dual Plan is based on the theory that only actual costs should be carried into the financial statements. Consequently, standard costs are cleared from the books as soon as they have served their purpose as aids to control manufacturing operations. The main advantages of the Dual Plan are: Through use of basic standards which remain unchanged it is possible to measure trends in performance over a considerable period, and to project rates of change into the future to aid the planning of future operations; management is enabled to judge the degree of variation from standard; prorating variances and handling of scrap losses, etc., require a minimum of clerical work. This method provides both adequate control data and cost information.

Production order cost accounting system. Another variation of collecting costs is the Production Order Cost Accounting System. This is a cost accounting system in which the cost of each unit or each lot of goods manufactured is computed, and is referred to as a specific order, or job lot production order, cost system. Under this system the cost of each lot appears in the reports of the accountant. An excessive cost in any item may be investigated. The use of this system enables the cost of material, labor, and indirect manufacturing costs on each lot of goods to be shown separately.

A cost accounting system utilizes perpetual inventories. The Raw Materials Inventory account shows the beginning balance, the purchases, and the issues from the storeroom to the plant. The Work In Process

Inventory account shows as debits the value of the beginning inventory, the raw materials issued to the plant, the costs of direct labor, and the estimated indirect manufacturing costs applied to the work in process. The Finished Goods Inventory account shows as debits the cost of the beginning inventory and the cost of goods manufactured, and as a credit the cost of goods sold.

The Cost Sheet is a subsidiary record, which shows detailed costs of each lot of goods being manufactured, of the Work In Process Inventory account. Thus the Cost Sheet accumulates the cost of each lot of goods manufactured.

The most commonly used methods of allocating indirect manufacturing costs to production orders are the labor cost method, the labor hour method, and the machine hour or production center method. Under the direct labor cost method, a certain percentage of the direct labor cost charged to each job is added to each production order for estimated indirect manufacturing costs applicable to that job. The predetermined rate is computed in advance of the production period by dividing estimated indirect manufacturing costs by the estimated direct labor costs. Under the direct labor hours method, a certain rate or number of cents per direct labor hour actually charged to each job is added to each production order for indirect manufacturing costs applicable to that job. This rate is computed by dividing estimated indirect manufacturing costs by the estimated direct labor hours. Under the machine hour method, a certain rate per machine hour charged to each job is added to each production order for indirect manufacturing costs applicable to that job. The rate is determined by dividing estimated indirect manufacturing costs by the number of hours it is estimated that the machines will be used.

<u>Summary</u>. It can be seen from the above discussion that setting of

standards for cost elements has the purpose of using standards for controlling costs, and the use of the same standards to develop unit product costs for establishing selling prices or other purposes. Costs are controlled by people. It is through the action of an individual, or group of individuals that costs are corrected or reduced to an acceptable level. It is through the operational control of the departmental foreman that labor efficiency is maintained. As a result, standards, to be most effective, must relate to specific phases of performance rather than merely general results. In a manufacturing operation, standards should relate to the quantity of labor, material, or overhead in the execution of a particular operation, rather than to the complete product cost standard.

It is well to set standards for cost control, but the mere setting of standards by no means assures control of costs. Costs are held within limits by human beings—with all their weaknesses and frailties, with all their prejudices and stubbornness. To get the greatest good from standards, they must be "sold" to the people who use them. The yardsticks should be accepted with enthusiasm as a goal to be met. This enthusiasm must be sustained through a well-founded realization that the standards are fair and reasonable.

Provision must be made for the accumulation of costs by cost centers which follow organization structure. This cost accumulation must reflect only those costs which are direct as to the specific function being measured. Allocations and re-allocations may be made for product cost determination, but this is not desirable for cost control. If a great many prorations are made, it is difficult to determine where the inefficiency exists, or the extent of it. Therefore, it is desirable to collect costs at the point of incurrence.

Standards should be set for all cost items of a significant or material amount. The more important the cost, the greater is the opportunity or need for cost control.

Managements of enterprises use accounting techniques in order to be informed of how well the objectives are being obtained. Accounting information is also used to assist in the preparation of sound business forecasts. Use of the budget concept, an effective method of reporting, and cost standards integrated into the budget and the reporting system, enables management to adequately judge actual performance in comparison with expected performance.

CHAPTER II

USE OF COST CONTROL IN THE DEPARTMENT OF THE NAVY

Section 1. Introduction

Fundamental considerations relating to cost control in governmental accounting. The discussion in Chapter I highlighted the theory of cost control for use in business enterprises. Governmental activities are also enterprises which require sound management, which in turn requires the use of sound tools of management. The principles of sound management of business enterprises are applicable to enterprises in all phases of human activity. Where planning for maximum net profit is the goal of management in commercial enterprises, planning for most efficient and economical rendering of service is the goal in the management of governmental activities. Members of Congress are aware of modern management practices and insist that governmental activities be managed in accordance with these practices.

In order to closely approximate the financial operations of modern commercial enterprises, working funds have been established to finance modern governmental enterprises which closely approximate commercial activities in their operation. Working capital funds, which are sometimes called "revolving funds", are those funds established with a fixed amount of capital to take care of a manufacturing or service operation which is self-sustaining in nature. Their receipts may consist of sales of products to outside parties or of transfers from other funds. Usually no definite estimate can be made of their operations and they are not included in budgets or in appropriation acts. The principal requirement is that the capital

sums be kept intact, being represented by cash, receivables, or inventory. Therefore, working capital funds are not expendable.

Three classes of funds may be recognized as working capital funds: (1) Funds relating to a productive activity which are reimbursed for outlays by sales of products; (2) funds established to provide capital for a stores system, organized to maintain a central stock of supplies to be requisitioned by all departments of a government, the fund to be reimbursed for its outlays by transfers from other funds; (3) funds established to provide capital for a service department, organized to render service to all departments of a government, the fund to be reimbursed for its outlays by transfers from other funds.

Working capital funds may have the following resources: (1) Cash; (2) accounts receivable; (3) due from other funds; (4) materials; (5) work in process; and (6) finished stock. The obligations of working capital funds consist of : (1) Accounts payable; (2) due to other funds; (3) capital; and (4) surplus.

In governmental accounting, job accounting is used to determine the cost of each item of service undertaken, on the basis of which a correct charge can be made. Job accounts are opened either by setting up a series of accounts covering the various operations to be reported upon regularly, known as "standing jobs"; or by issuing a "job order" for a special piece of work to be done. The former method is used for continuous operations, and reports of costs are made monthly; the latter is used for all other work.

Items of cost on job accounts may be classified as: (1) Labor, including all direct labor on account of the work covered by the order; (2) material, including all material actually used on the job, at purchase price or price charged from storeroom, less credit for material returned; (3)

miscellaneous, including all items of direct chargeable cost not included under labor or material; and (4) overhead, including costs, such as salaries of foremen or clerical and office expense, which are not directly chargeable to any specific job, but which must be prorated to all jobs on some fixed basis to be determined.

Cost finding practices of government are the accounting and statistical processes for recording and classifying expenses by activity, and the further processes by which activity is measured and recorded. Cost accounting in government is primarily a means of securing expenditure control and of implementing administrative action. Governmental accounting may not find it necessary to include taxes, insurance expenses, and interest in its costs, and often fails to consider the element of depreciation.

Another objective of governmental cost systems is to permit more accurate budgeting. It is difficult to estimate the financial requirements of an activity for a year or two years in advance. Such estimating can be accomplished better if the costs of the various activities, functions, and operations are known. With this information it is possible to prepare work programs, the quantity of work to be done, and then to apply the unit cost of these estimates to arrive at the amounts to be appropriated. The work program supports the total amount of the request for funds and permits a proper evaluation of the various requests for funds.

Cost accounting is sometimes maintained on a completely independent basis, operated independently of the general accounts but related to them by reconciliation, or may be directly subsidiary to the general accounting system and balanced with control accounts in the general ledger. Distribution of indirect costs is accomplished in conventional cost accounting practice through the accumulation of charges in cost centers, or clearing accounts.

Section 2. The Use of Predetermined Costs in the Department of the Navy.

Introduction. On the sea there is a tradition older even than the traditions of the country itself. It is the tradition that with responsibility goes authority, and with them both goes accountability.

In order to understand the application of cost principles to Department of the Navy installations, it is first necessary to discuss briefly some aspects of the organization of such installations. The installations in which cost principles have been applied are primarily of the industrial-type or commercial-type. Such an installation may be a naval shipyard. The primary mission of the shipyard is to build, overhaul, repair, or service ships and craft of the Navy. The personnel, plant, equipment, and facilities devoted to the building, overhauling, repairing, or servicing of ships and craft are the productive aspects of the shipyard which have been placed under a cost control system by establishment of the Navy Industrial Fund. This fund finances these aspects of the shipyard, and requires that they be managed as nearly as possible on a commercial basis. This means that agencies of the Department of the Navy, primarily elements of the Fleet Commands, are billed for all productive effort in servicing ships. In order that the Fleet Commands may be properly billed, and, in addition, be able to estimate the costs of such services in requests for funds, it is necessary that each element used in providing the services be costed. Not only must the elements of servicing be costed, but they must also be priced. As explained in the subsequent paragraphs, this is accomplished by means of a project order. The project order is essentially an application of the production order cost accounting system. The prices quoted are predetermined prices, based on sound cost estimates established by the shipyard. Obviously, the personnel who perform the estimating must provide a sound estimate of costs in order to avoid unfavorable

comparison with other naval shipyards.

The Department of the Navy has found that the use of the word "standards" results in unfavorable connotations. Consequently, the terms "predetermined selling prices" or "predetermined costs" are employed. Variances from these predetermined prices are set out as gains or losses. The predetermined prices are reviewed periodically and reestablished to offset the gains or losses, so that, in the long-run, prices billed are as nearly as possible equal to the actual costs of performing the work.

The installation may have other activities located within its limits which are in addition to its productive facilities. An example would be the Supply Department, which may act both as a source of materials and supplies for the productive facilities and as a stock point for the Naval Supply System, which provides supply support to various other installations in the general geographical area. The cost of operating these additional activities do not enter into the computation of the costs which result in the predetermined prices to be charged to the customers. The cost of operating these activities are carried by the agency of the Department of the Navy with management responsibility for the operation of such activities. Thus, the productive facilities of the installation are set off as a management unit responsible to the local commander. The fact that military command relationships may interlace with this unit in no way affects the local management responsibility.

The objective of management at these naval installations, as in any activity of the Government, is to render the most efficient service possible as economically as possible.

Functions of the Comptroller of the Navy. The Comptroller of the Navy develops, prescribes, and supervises the execution of principles, policies,

and the procedures to be followed in fiscal, cost, capital and operating property, and in working capital and management funds, accounting throughout the Department of the Navy. These accounting systems are designed to provide full disclosure of the financial results of operations to meet the requirements of both internal management and external agencies; adequate cost, obligation, expenditure, and other financial information needed for management purposes; and reliable and prompt accounting data furnished in a manner useful for preparation and support of budget estimates and in administration of the budget. The Comptroller of the Navy is responsible for developing policies and procedures for industrial fund financing of industrial- or commercial-type activities in order to control and account more effectively for the cost of work performed. He measures and analyzes the rate of obligations and expenditures against the budget plan; evaluates performance, program status, and trends against approved programs and budget plans; and reports to top management any significant variances therefrom together with the facts and figures necessary to assist in decision-making.

The Comptroller of the Navy is responsible for all procedures in the areas of budget formulation and administration, accounting fiscal operations, progress and statistical reporting, and internal audit. The Comptroller of the Navy administers and coordinates programs for the extension of financial assistance to research, production, and supply contractors through the media of guaranteed loans and advance payments. He develops policy for, and coordinates the administration of, progress payments designed to supplement the available working capital of contractors.

The Assistant Comptroller of the Navy, Accounting and Finance, is charged with responsibility for the organization and administration of matters relating to accounting and finance; development and supervision of the execution of principles, policies, and procedures to be followed in fiscal

cost, capital and operating property accounting, and working capital and management fund operations throughout the Navy; prescription of the type and content of basic fiscal, cost, capital and operating property accounting records to be maintained by the bureaus and offices of the Department of of the Navy; development of uniform terminologies, classifications, and procedures in these areas; development and preparation of recurring summary reports of a fiscal, cost, capital and operating property accounting nature, and compilation of special reports on these matters as required.

In establishing an integrated system for financial management, the Department of the Navy has established the basic functions of the comptroller at a field activity. Under this system, the field activity comptroller establishes, coordinates, and maintains an integrated system for financial management by means of which he provides to the commanding officer the factual data essential for effective management control of operations. The field activity comptroller maintains a classification of the programs administered by the activity and their objectives, together with a current inventory of budget plans and program schedules. The field activity comptroller is responsible for: Budget formulation, review, and administration; the collection of obligation, expenditure, cost, and other accounting and operating statistics data; the review of program performance against the financial plan; and the promotion of economy and efficiency in the performance of assigned programs.

At the field activity level, accounting and disbursing personnel are responsible for: Maintenance of required accounting records, including records of obligations and expenditures against allotments and project orders; preparation of accounting reports both for local management and for submission to higher authority; conduction of cost accounting operations; supervision

and conduction of timekeeping operations; and similar functions. Accounting and disbursing personnel at the bureau level perform accounting, within the framework of the Navy-wide accounting system, for appropriations and funds under the control of the bureau, and maintain the records necessary for this function. These personnel are responsible for fiscal reporting, evaluation and analysis, and for devising and recommending instructions and procedures relative to field accounting operations under bureau management control.

Consequently, accounting personnel at the bureau level are responsible for operating the bureau appropriation accounting system; maintaining official ledgers and subsidiary records covering the funds for which the bureau is responsible; and developing appropriation and cost accounting systems and related procedures peculiar to a particular bureau. Field accounting personnel may, as authorized within the framework of the Navy accounting system, issue instructions pertaining to field accounting procedures, and develop accounting and fiscal reports to provide information for management supplementary to that provided by the Navy-wide accounting system. Field personnel maintain required accounting records, including records of obligations and expenditures against allotments and project orders; prepare accounting reports for local management and for submission to higher authority; conduct cost accounting operations; and maintain civilian pay records and prepare civilian payrolls. Maintenance of cost records and internal controls to insure accuracy of records and propriety of charges is necessary to accomplish the above functions.

<u>The review and analysis program</u>. The review and analysis program is initiated at the field activity level. The comptroller of the field activity is responsible for this program as a part of his responsibility for providing management with factual data essential for efficient, economical and effective financial management control. Although the program deals primarily with

financial income and cost matters, it must include matters of an operating nature which affect the financial condition, operating income, and operating costs of the field activity.

The review and analysis program conducted by the comptroller at the field activity level will be based, for the most part, upon the principle of "management by exception". In general, the program is executed through the medium of the following:

(1) Conducting a continuous internal review of financial, income, cost and operating matters in order to provide effective internal control;

(2) Making a review and analysis of budget estimates submitted by the responsible members of management in order to properly coordinate operating budgets;

(3) Making a review and analysis of the contents of monthly fiscal and cost statements in order to assure that these statements are accurate and complete; to analyze variances between budgeted and actual operating income and costs; to detect unfavorable conditions or trends; and to provide management with essential factual data.

The results of the comptroller's review and analysis program at the field activity level is summarized and explained in the comment section of the operating budgets and financial statements; thereby bringing these matters to the attention of field activity management, bureau management, and the Comptroller of the Navy. Some of the more important matters which are commented upon are as follows:

(1) Unfavorable changes in financial condition (i.e. in assets, liabilities or investment of the Government). Operating results are related carefully to financial condition to avoid hazards of misinterpretation. These hazards are: (a) Effective operating management may be concealed by an

unfavorable financial situation; or (b) poor operating performance may go unrecognized because of a favorable financial situation.

(2) Significant variances between forecasted and actual assets, liabilities and investment of the Government.

(3) Significant variances between budgeted and actual income or between predetermined unit selling prices and actual unit costs, classified as to type of product or service.

(4) Significant variances between budgeted and actual direct or overhead costs, classified as to cost center (i.e., department, division, shop, etc.) and job order and/or type of product or service, with particular attention to such items as direct costs, excessive or unusual overhead costs, etc. .

(5) Significant amounts of overapplied or underapplied overhead costs and/or revisions in overhead rates for each cost center.

(6) Actual or anticipated changes in operating plans, policies, methods, procedures and conditions which have affected, or will affect the forecasted or actual financial condition of the Navy Industrial Fund financed field activity, the predetermined unit selling prices or actual unit costs, and the budgeted or actual operating income or operating costs.

(7) Significant changes or anticipated changes in level of operations and the effect of such changes on application of overhead costs and idle plant capacity.

(8) Adverse financial or cost trends in any of the foregoing areas which are of sufficient importance to require comment.

(9) Outstanding accomplishments which demonstrate the utilization of budgeting, accounting, and reporting under Navy Industrial Fund financing as a management tool in effecting economies, promoting efficiency or increasing

production, together with a summary of dollar savings or intangible benefits resulting therefrom.

The review and analysis program of the bureau is coordinated closely with that of the field activity level. The field activity is advised promptly regarding the results of the review and analysis by the bureau, particularly regarding any corrective action required at the field activity level.

The Comptroller of the Navy is advised promptly, in summary form, of the results of the review and analysis by the bureau. This summary report includes: Comments and recommendations regarding the periodic operating budgets and monthly financial and cost statements for each Navy Industrial Fund financed field activity; and comments regarding corrective action taken at the bureau level.

Operation of the Navy Industrial Fund. Section 405 of the National Security Act, as amended, authorizes the Secretary of Defense to require the establishment of working capital funds in the Department of Defense for the purpose of providing working capital for such industrial-type activities as provide common services within or among the departments and agencies of the Department of Defense.

The Department of the Navy established one consolidated working capital fund, known as the Navy Industrial Fund, in accordance with this authority. The fund consists of unexpended balances of cash on deposit in the Treasury, or its equivalent; accounts receivable, stores of supplies, materials, and work in process; finished goods; and all other current assets pertaining to or acquired in the operations of the establishments financed under the fund; subject to all liabilities incurred in connection with such operations. Plant and equipment used in operations of the establishments financed under the fund do not constitute part of the fund, although the

purchase of certain equipment may be financed from the fund.

It is the purpose of the Navy Industrial Fund to provide an effective means for controlling the costs of goods and services produced by industrial- and commercial-type installations, and an effective and flexible means for financing, budgeting, and accounting for such operations. When individual agencies within the department are permitted to be completely financed, and to order and pay for goods and services furnished by industrial- or commercial-type installations, the officials of those agencies have a greater sense of responsibility and self-restraint in limiting their orders based upon availability of funds and balancing the cost of such goods or services against the benefits and advantages of their use. Moreover, the creation of the complete buyer relationship places the ordering agency in the position of critic of purchase prices (i.e., costs) as well as quality and speed of delivery of the goods and services furnished. The use of the industrial fund permits a more complete establishment of a performance-type budget and accounting structure, with which the costs of goods and services furnished by industrial- or commercial-type installations may be budgeted and accounted for under the program or function for which they have an end-use. The Navy Industrial Fund has been assigned the Treasury account symbol 17X4912. Sub-head symbols have been assigned to the various installations financed under the fund.

Whenever an agency of the Department of Defense orders construction, manufacturing, or similar work from an industrial- or commercial-type installation of the Department of the Navy, it issues a project order in accordance with the approved regulations. This order serves as a basis for undertaking the work, billing the ordering activity, and for the obligation of appropriations of the ordering agency in the same manner as a purchase order or contract with an outside industrial establishment.

As a general principle, each installation operating under the industrial fund is reimbursed regularly for all costs of work performed or for other costs incurred not related to production of goods or services, with the objective of maintaining the working capital established in the fund. Each industrial- or commercial-type installation bills ordering agencies for work performed upon the basis of jobs completed to the extent feasible. The cost of such jobs may be billed daily on an individual job basis, or on a weekly or monthly basis for groups of jobs completed. Whenever a long period of time is required in the performance of a project order, periodic progress payments approximating costs incurred may be provided for in the same manner that such payments are provided for under contracts with outside parties.

The ordering agency reimburses the industrial- or commercial-type installation for actual costs incurred by that installation, excluding military pay and allowances, depreciation, and other items of statistical costs. Wherever feasible, however, predetermined prices or rates, based upon cost estimates, are used in billing and obtaining reimbursement from ordering activities. Costs incurred which are not applicable either directly or indirectly to productive work are not included in the cost of operation of an installation operated under the industrial fund. These include costs of additions to plant and equipment, costs of removal and salvage of items of plant and equipment retired, costs of maintenance of idle plant and equipment, and cost of operation and maintenance of activities physically located within the installation but not participating in the production of goods and services.

a. Cost accounting methods. The job cost accounting method is followed in collecting and determining the costs of any particular project order, wherever appropriate. When predetermined or estimated costs are used

as a basis of billing and obtaining reimbursement from ordering agencies, actual costs of work performed may be determined by classes of work rather than by individual jobs for the purpose of comparison of actual costs and predetermined costs billed to ordering agencies. Adjustments of the predetermined prices are required from time to time, with the objective that in the long-run total reimbursements shall be as nearly as possible to actual cost.

Each installation has a cost accounting system "custom-built" for its operation. This system observes the accrual basis of accounting and employs the double-entry method of bookkeeping. Books and records of account, together with documents supporting transactions, are kept at the office of the installation. Cost of each project order or class of work performed is computed for the purpose of billing ordering agencies on the principle of excluding those items for which the expenditures are not made by the performing installation. Excluded costs include indirect costs sustained by the Department of Defense outside the limits of the industrial installation, such as costs of procurement, storage, and issue of materials and supplies incurred in the basic supply system. Because depreciation on Government owned plant and equipment is not "funded", this element of cost is also excluded. However, such excluded costs are determined and recorded statistically in order to approximate full cost of all work performed. The objective of reducing the amount of statistical costs for each installation to a minimum is pursued. It must be recognized that the Department of Defense is engaged heavily in training and in the operation and maintenance of facilities and organizations under peacetime conditions for use in an emergency, which operations are not necessarily economic from a business viewpoint, and it is not possible in every case to identify all nonproductive costs.

Materials and supplies used from stock, as determined either by pricing issue requisitions or by inventory, are priced in accordance with the regular procedures established by the Department of the Navy. Direct and indirect materials and supplies are costed separately in the accounts. Indirect materials and supplies are treated as overhead costs.

Civilian labor and salaries are charged to jobs at actual cost. Charges for direct labor include overtime and provision for annual and sick leave. Charges for indirect labor, including administrative salaries, are treated as overhead costs and also include provision for overtime and annual and sick leave.

Overhead costs are accounted for by whatever organizational units within the industrial installation are appropriate from the standpoint of cost control and relative accuracy of costs of project orders to be billed. Any generally accepted method may be used for pricing individual jobs, provided it meets the test of reasonable accuracy as well as simplicity. Overhead costs applicable to idle plant or facilities are separately determined and made the subject of separate reimbursement from appropriations managed by the agency responsible for the management of the particular industrial-type installation. In general, it is expected that overhead rates will be established for the purpose of costing products or work performed in a manner that will prevent any loss to the industrial fund.

b. Budgetary control. Each agency which may order work performed from an industrial- or commercial-type installation budgets annually for the estimated cost of the project order to be placed. Each agency responsible for the management of an industrial- or commercial-type installation operated under the industrial fund budgets for the estimated cost of maintenance of idle plant and equipment of such installations, the estimated cost of

additions to plant and equipment, and the estimated cost of removal or salvaging of plant and equipment retired. Each installation operated under the industrial fund prepares a commercial-type budget annually, covering the operating costs of the installation based on the cost accounting system adopted and showing how such costs will be financed. Establishment procurement budgets are based on consumption budgets and required stock levels. The budget for materials and supplies to be consumed must be in agreement with amounts estimated to be consumed as shown by the budget for the estimated cost of operations of each installation.

c. Reporting. Monthly summary operating reports are prepared by each installation operated under the Navy Industrial Fund. These reports include balance sheets and operating statements of a commercial type, together with appropriate schedules showing cost progress and performance by appropriate work classifications. Actual operating costs are compared with budgeted costs wherever feasible.

Section 405(c) of the National Security Act, as amended, requires each military department to submit an annual report on the operations of its industrial fund to the President and the Congress through the Secretary of Defense.

Determination of product costs. Reports of cost estimates, in terms of units of product or service as well as aggregate amounts or elements of cost, are made under projected conditions. Cost estimates represent estimated costs based on practical considerations of estimated production schedules, and labor, material and facilities requirements. Cost estimates are subject to validation by actual cost records. Reports of cost estimates of a given installation or activity show the aggregate cost of the planned production classified by direct labor, direct material and overhead for a fiscal year.

All elements of cost which are incurred by the Government in making a product or rendering a service at an industrial- or commercial-type installation are included, whether or not those costs are borne by the activity concerned. Where the activity is part of a larger installation which furnishes supervision or supporting services to it, the estimated costs of all such supervision or supporting services are included in the cost estimates. The cost of services furnished by the industrial activity to other missions of the installation do not contribute to product costs, and, therefore, are excluded from cost estimates.

Elements which are included in determining costs are: (1) Personnel services; (2) materials and supplies; and (3) indirect costs (overhead). Personnel services are classified as direct labor when the costs are incurred in performing work identifiable with a product. Labor costs are estimated on the basis of the best available work measurement and performance data. Direct materials include all items purchased, supplied, manufactured or fabricated which enter directly into the end-product. Estimates of material quantities required for production are based on estimated or actual bills of material. Estimates of costs of indirect materials and supplies are normally calculated by applying experience ratios to the cost of direct materials. Indirect or overhead costs fall into one of two categories: Manufacturing or production expenses; or general and administrative expenses. Overhead rates may be applied to direct labor dollars or hours as preferred for cost allocation to the product.

Other areas of application. The Department of Defense is continually attempting to apply the principles of sound cost control to activities other than the industrial- or commercial-type activities. A task force is currently studying storage space and tonnage reporting procedures and requirements.

Among the areas in which this task force is working is the area of warehousing matters. Certain definitions have been determined by this task force. The term "receiving" includes the cost of personnel, operating supplies and all other costs incurred in the administration, paper work, and physical handling directly connected with the physical receiving of issuable material from without the activity command, from the time the material first enters the activity until it is placed in its final resting place in the storage warehouse or area to which it is assigned. Similar definitions have been established for the terms "custody" and "issuing".

CHAPTER III

SUMMARY

The purpose of this paper is to indicate an effective tool useful to management in conducting an enterprise toward successful accomplishment of its objectives. In order to make sound decisions in adjusting the operations of an enterprise to the constantly changing enviornment in a dynamic economy, those individuals responsible for the conduct of the affairs of an enterprise need to have at hand reliable information concerning the degree of accomplishment of the objectives set for the enterprise. It would be impossible for the most astute manager to make such decisions if all the information generated in an enterprise were to be presented to him for his use. Therefore, it is necessary to summarize operational information in a manner which will permit effective evaluation of its implications. The accounting records provide a source of information which can be conveniently summarized for presentation to management. Management can prepare operational budgets, based on such information, which provide effective planning of future operations of the enterprise. These budgets set the goals for the operating departments in the conduct of day-to-day affairs. An effective reporting system reports back to management the manner in which the plans contained in the budget are being accomplished. The concept of cost control enables the management team to utilize the results of the budget and the reports in effecting over-all control of the operations of the enterprise. Cost standards provide a basis for effectively projecting operational situations and conditions in the preparation of sound forecasts. After the results of the forecasts have been made known, cost standards provide a basis for comparing actual performance

against the performance reasonably expected in view of the forecasts. In those situations where actual performance does not meet expected performance, cost standards provide a basis for evaluating the causes of variances and the measures considered necessary to correct the variances. It can be stated that cost standards provide a means of evaluation by which future operations can be planned with efficiency, current operations can be conducted with efficiency, and the necessary adjustments can be made with efficiency.

It is true that operating controls precede accounting controls. Accounting controls are not enough in themselves, but, when combined with operating controls, can be of great assistance to intelligent management.

Standards are set for the following elements of cost:

(1) Direct material;

(2) Direct labor;

(3) Expenses.

When costs are classified according to personal authority over spending, responsibility for the elements of cost can be assigned to a specific person, and a cost control system provides a means for accounting for that responsibility.

Of the several methods available for cost-keeping, applications in the Department of the Navy are best suited to the production order cost accounting system. Regulations for the use of the Navy Industrial Fund to finance the operation of industrial- or commercial-type installations provide that cost accounting systems will be custom-built to meet the needs of the particular installation. Consequently, any one of the several methods of determining particular standards is available for use by these activities.

Effective management of naval industrial installations has required the use of effective cost control methods. Extension of these methods to

other types of naval installations is being accomplished.

An industrial comptroller has stated: "You have to run very fast to stand still in the modern economic environment." Effective cost control provides sufficient added horsepower to make real progress in this race.

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